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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/535,329

05/18/2005

Brent L. Carpenter

432081

5708

30955 7590 06/29/2007  
LATHROP & GAGE LC  
4845 PEARL EAST CIRCLE  
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EXAMINER

BHAT, ADITYA S

ART UNIT

PAPER NUMBER

2863

MAIL DATE

DELIVERY MODE

06/29/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

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<b>Office Action Summary</b>	Application No. 10/535,329	Applicant(s) CARPENTER, BRENT L.	
	Examiner Aditya S. Bhat	Art Unit 2863	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 March 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4, 5, 15, 16 and 24-27 is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-14 and 17-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 6-14, and 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bose et al. (USPN 5,734,112) in view of Barger et al. (USPN 6,513,392).

With regards to claim 1, Bose et al. (USPN 5,734,112) teaches a sensor (100), characterized in that the sensor comprises:

a conduit configured for conveying a material, (col. 2 lines 63-64)

a vibrator configured for vibrating the conduit along a first cross-sectional axis and for vibrating the conduit along a second cross-sectional axis; (col. 2 lines 64-67)

a sensor configured for detecting a first frequency along the first cross-sectional axis (a) and for detecting a second frequency along the second cross-sectional axis (b); (Col. 9, lines 18-21) and

a processor (Col. 9, lines 9-10) configured for determining a pressure of the material based on a ratio of the first frequency and the second frequency. (col. 3, lines 10-13)

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With regards to claims 2, 13 and 14, Bose et al. (USPN 5,734,112) teaches the conduit comprises a cross-section selected from one of an elliptical shape and an oval shape. (12,14 figure 1)

With regards to claim 3, Bose et al. (USPN 5,734,112) teaches the first frequency is a function of design constants, mass of the material and an elasticity of the conduit. (Col. 4, lines 12-13)

With regards to claims 6 and 17, Bose et al. (USPN 5,734,112) teaches the pressure linearly corresponds to the ratio of the first and the second frequencies. (Col. 3, lines 10-13)

With regards to claims 7 and 18, Bose et al. (USPN 5,734,112) teaches the conduit is elastically deformable to change a length of the second cross-sectional axis based on the pressure of the material. (col. 2 lines 34-36)

With regards to claims 8 and 19, Bose et al. (USPN 5,734,112) teaches the processor comprises a converter configured for receiving control signals from the sensor and for digitally converting the control signals to represent the first frequency and the second frequency. (col. 8, lines 49-50)

With regards to claim 20, Bose et al. (USPN 5,734,112) teaches processing the digital representations of the first resonant frequency and the second resonant frequency to determine the pressure of the material based on the squared ratio of the first resonant frequency and the second resonant frequency. (Col. 7, lines 40-45)

With regards to claims 9 and 21, Bose et al. (USPN 5,734,112) teaches the processor further comprises a calculation module configured for determining a density of the material from one of:

a calculation of the pressure, a pressure compensation factor, and one of the first frequency and the second frequency, (col. 3, lines 19-21) and

a calculation of an average of the first frequency and the second frequency. (Col. 28, lines 17-18)

With regards to claims 10 and 22, Bose et al. (USPN 5,734,112) teaches a temperature sensor configured for detecting a temperature of the material conveyed through the conduit and for generating a temperature control signal for processing by the processor; (Col. 5, lines 60-63) and

a timing controller configured for synchronizing the processing of the temperature control signal with the determining of the density. (Col. 6, lines 1-5)

With regards to claims 11 and 23, Bose et al. (USPN 5,734,112) teaches a frequency sensor configured for detecting a phase difference in at least one of the first and the second frequencies, wherein the processor is further adapted to determine a mass flow rate of the material based on the phase difference. (Col. 1, lines 40-43)

With regards to claim 12, Bose et al. (USPN 5,734,112) teaches a method of measuring a property of a material (F) conveyed through a conduit, characterized in that the method comprises:

vibrating the conduit along a first cross-sectional axis (a); vibrating the conduit along a second cross-sectional axis (b); (col. 2 lines 64-67)

detecting a first resonant frequency along the first cross-sectional axis in response to vibrating the conduit at the first cross-sectional axis; detecting a second resonant frequency at the second cross-sectional axis in response to vibrating the conduit along the second cross-sectional axis; (Col. 9, lines 18-21) and

determining a pressure of the material based on a ratio of the first resonant frequency and the second resonant frequency. (Col. 3, lines 10-13)

Bose et al. (USPN 5,734,112) does not appear to teach the conduit presenting a noncircular cross-section of major axis (a) and minor axis (b) of respective dimensions (a) and (b) wherein the cross-section tends to become slightly more circular as pressure internal to the conduit is increased.

Barger et al. (USPN 6,513,392) teaches the conduit presenting a noncircular cross-section of major axis (a) and minor axis (b) of respective dimensions (a) and (b) wherein the cross-section tends to become slightly more circular as pressure internal to the conduit is increased. (Col.12, Lines 53-56)

It would've been obvious to one skilled in the art at the time of the invention to modify the Bose reference to include the expandable conduit taught by Barger et al. in order to significant improvement in dynamic performance. (Col. 2, lines 39-40)

***Allowable Subject Matter***

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 4-5, 15-16 and 24-27:

Claims 4-5 and 15-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The primary reason for the allowance of claims 4 and 15 is the inclusion of: the ratio is related to the pressure through first and second inertial moments according to an equation having a form of  $(\text{first frequency})^2 / (\text{second frequency})^2 = I_a / I_b$ , where  $I_a$  is the first inertial moment and  $I_b$  is the second inertial moment. It is this/these features found in the claim(s), as they are claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this/these claim(s) allowable over the prior art.

With regards to claims 24-27, please refer to applicant's arguments dated 3/22/2007.

Claim 5 is allowed due to their dependency on claim 4.

Claim 16 is allowed due to their dependency on claim 15.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-27 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aditya S. Bhat whose telephone number is 571-272-2270. The examiner can normally be reached on M-F 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on 571-272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

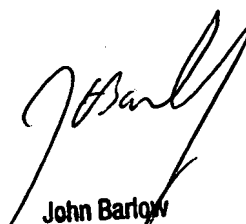


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Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Aditya Bhat  
June 25, 2007



John Barlow  
Supervisory Patent Examiner  
Technology Center 2800